

# **Product Architecture**



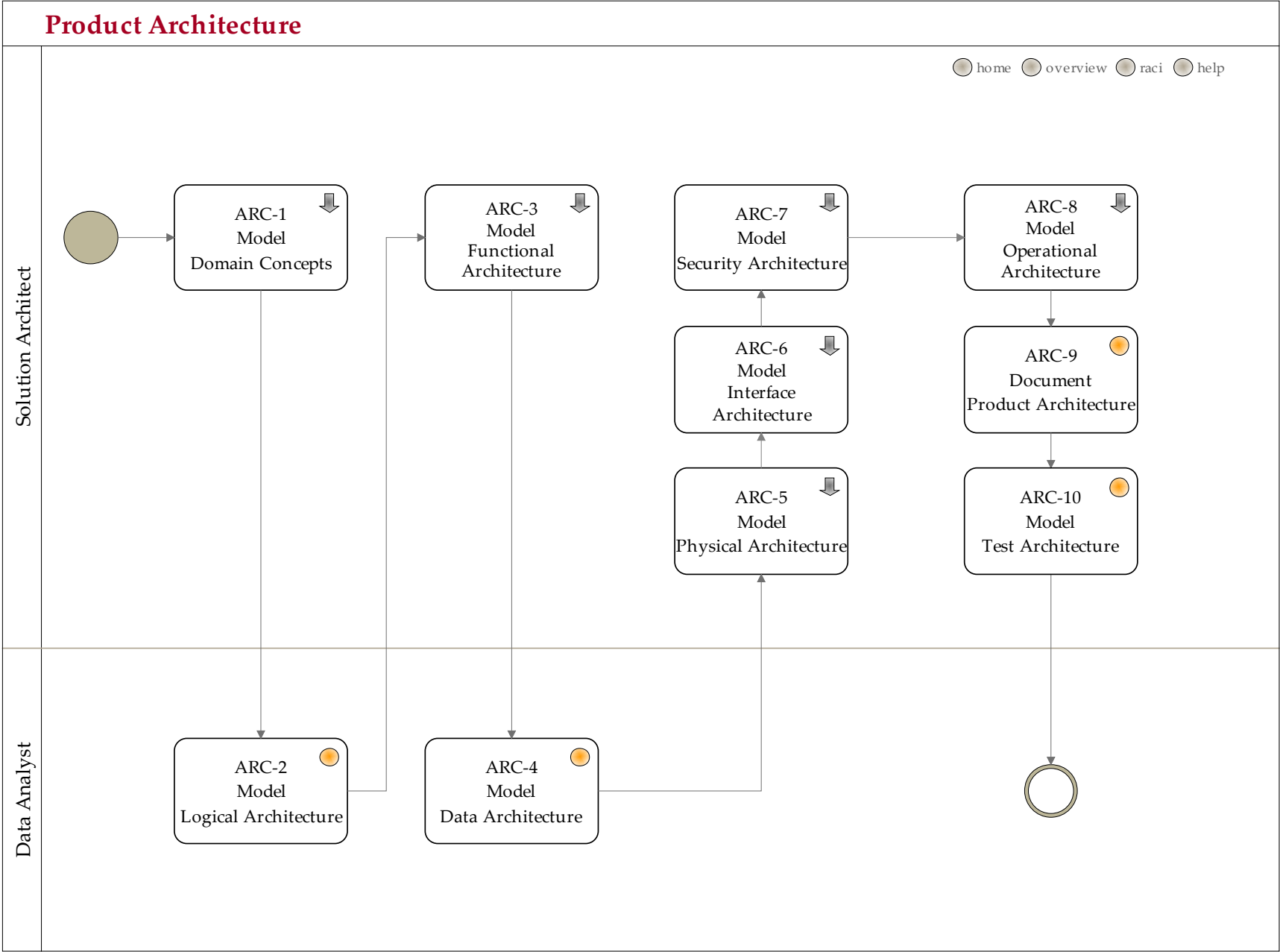
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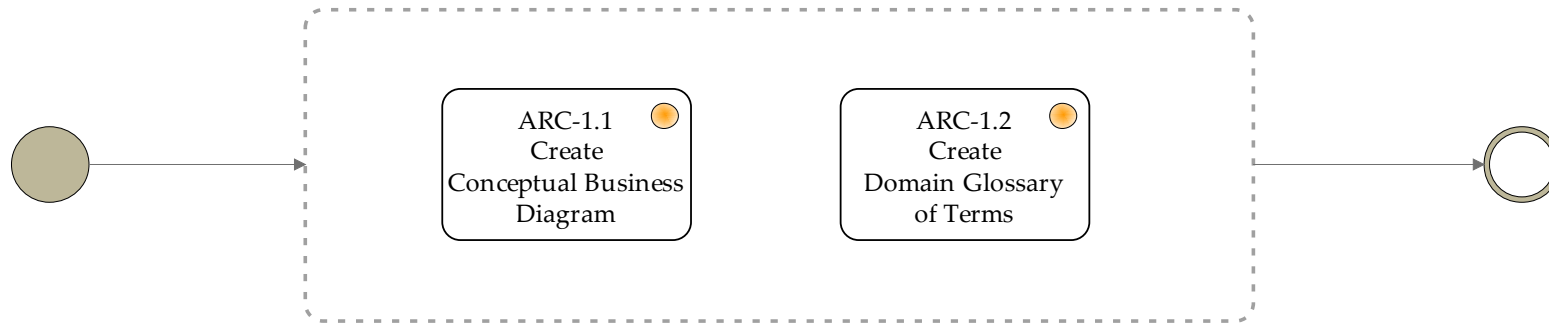
# Product Architecture Process Maps



## Product Architecture: ARC-1 Model Domain Concepts

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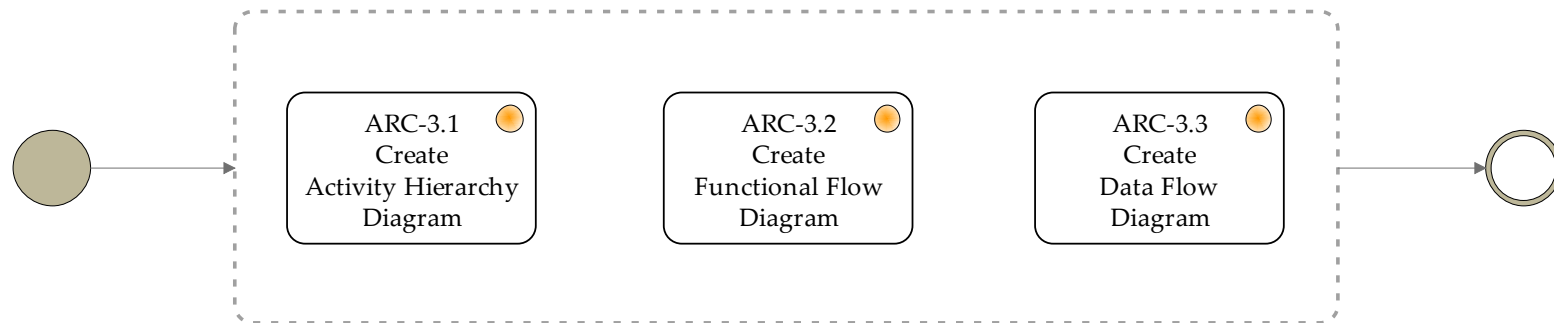
Solution Architect



## Product Architecture: ARC-3 Model Functional Architecture

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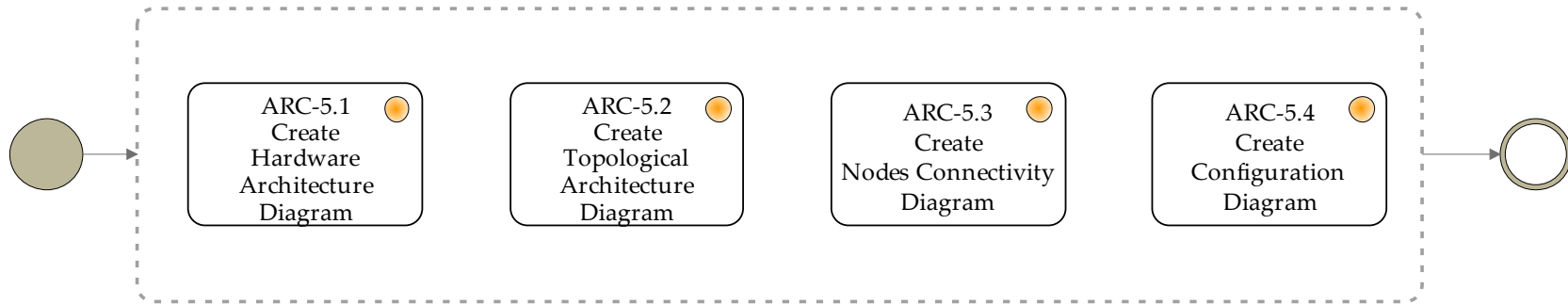
Solution Architect



## Product Architecture: ARC-5 Model Physical Architecture

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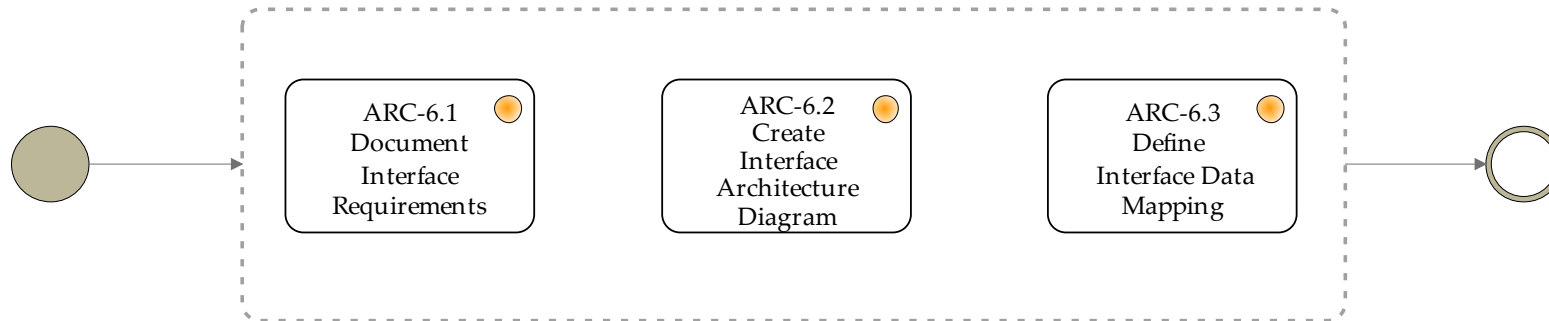
Solution Architect



## Product Architecture: ARC-6 Model Interface Architecture

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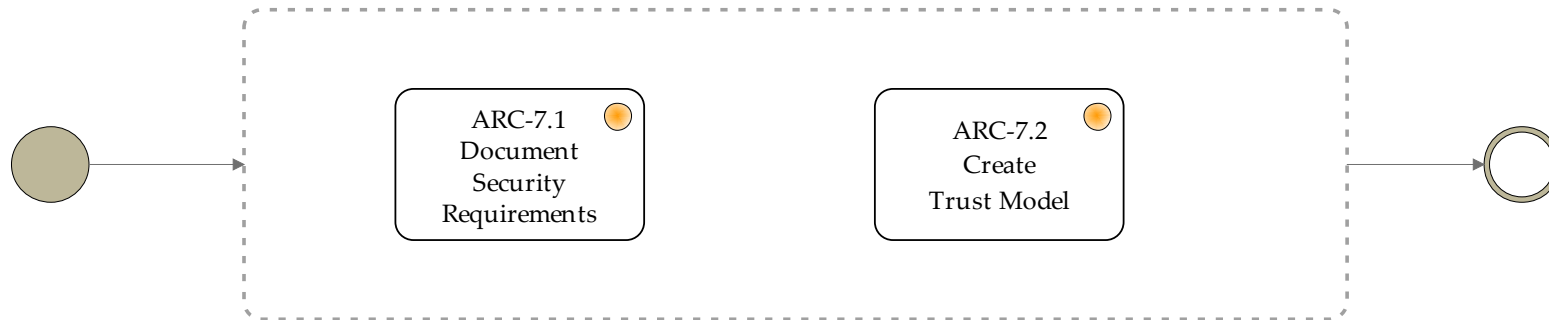
Solution Architect



## Product Architecture: ARC-7 Model Security Architecture

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Solution Architect

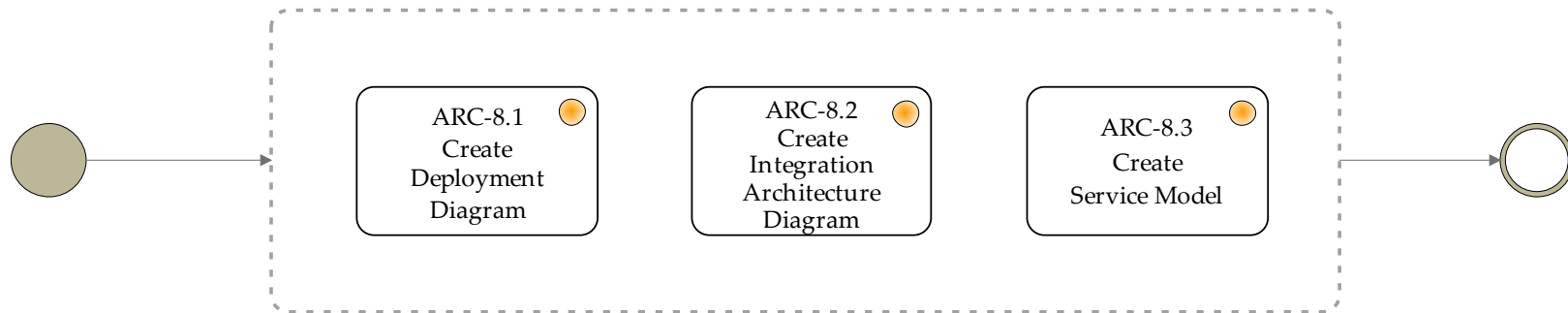




## Product Architecture: ARC-8 Model Operational Architecture

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Solution Architect



# Process: Product Architecture

Overview: The process map for Product Architecture cycles through the following process and review activities:

- ARC-1 Model Domain Concepts
  - ARC-1.1 Create Conceptual Business Diagram
  - ARC-1.2 Create Domain Glossary of Terms
- ARC-2 Model Logical Architecture
- ARC-3 Model Functional Architecture
  - ARC-3.1 Create Activity Hierarchy Diagram
  - ARC-3.2 Create Functional Flow Diagram
  - ARC-3.3 Create Data Flow Diagram
- ARC-4 Model Data Architecture
- ARC-5 Model Physical Architecture
  - ARC-5.1 Create Hardware Architecture Diagram
  - ARC-5.2 Create Topological Architecture Diagram
  - ARC-5.3 Create Nodes Connectivity Diagram
  - ARC-5.4 Create Configuration Diagram
- ARC-6 Model Interface Architecture
  - ARC-6.1 Document Interface Requirements
  - ARC-6.2 Create Interface Architecture Diagram
  - ARC-6.3 Define Interface Data Mapping
- ARC-7 Model Security Architecture
  - ARC-7.1 Document Security Requirements
  - ARC-7.2 Create Trust Model
- ARC-8 Model Operational Architecture
  - ARC-8.1 Create Deployment Diagram
  - ARC-8.2 Create Integration Architecture Diagram
  - ARC-8.3 Create Service Model
- ARC-9 Document Product Architecture
- ARC-10 Model Test Architecture

# **Product Architecture Description and Goals**

## **Description**

Product Architecture results in describing the product in an organized way that defines structural properties of the product. It defines the product components or building blocks and provides a plan from which products can be procured and/or developed, that will work together to implement the overall system. Key Product Architecture artifacts include: Conceptual Business Diagrams Physical Architecture Diagrams Functional Architecture Diagrams Interface Architecture Diagrams Deployment Diagrams

## **Goals**

Specific goals include development of:

- Conceptual Business Diagrams
- Physical Architecture Diagrams
- Functional Architecture Diagrams
- Interface Architecture Diagrams
- Deployment Diagrams

## **Product Architecture RACI Information**

The following describes the RACI information for this process:

### **ARC-1.1 Create Conceptual Business Diagram**

Responsible Role: Solution Architect

Accountable Role: Application and Data Architecture Service Director

### **ARC-1.2 Create Domain Glossary of Terms**

Responsible Role: Solution Architect

Accountable Role: Application and Data Architecture Service Director

### **ARC-2 Model Logical Architecture**

Responsible Role: Data Analyst

Accountable Role: Application and Data Architecture Service Director

### **ARC-3.1 Create Activity Hierarchy Diagram**

Responsible Role: Solution Architect

Accountable Role: Application and Data Architecture Service Director

### **ARC-3.2 Create Functional Flow Diagram**

Responsible Role: Solution Architect

Accountable Role: Application and Data Architecture Service Director

### **ARC-3.3 Create Data Flow Diagram**

Responsible Role: Solution Architect

Accountable Role: Application and Data Architecture Service Director

## **ARC-4 Model Data Architecture**

Responsible Role: Data Analyst

Accountable Role: Application and Data Architecture Service Director

## **ARC-5.1 Create Hardware Architecture Diagram**

Responsible Role: Solution Architect

Accountable Role: Application and Data Architecture Service Director

## **ARC-5.2 Create Topological Architecture Diagram**

Responsible Role: Solution Architect

Accountable Role: Application and Data Architecture Service Director

## **ARC-5.3 Create Nodes Connectivity Diagram**

Responsible Role: Solution Architect

Accountable Role: Application and Data Architecture Service Director

## **ARC-5.4 Create Configuration Diagram**

Responsible Role: Solution Architect

Accountable Role: Application and Data Architecture Service Director

## **ARC-6.1 Document Interface Requirements**

Responsible Role: Solution Architect

Accountable Role: Application and Data Architecture Service Director

## **ARC-6.2 Create Interface Architecture Diagram**

Responsible Role: Solution Architect

Accountable Role: Application and Data Architecture Service Director

### **ARC-6.3 Define Interface Data Mapping**

Responsible Role: Solution Architect

Accountable Role: Application and Data Architecture Service Director

### **ARC-7.1 Document Security Requirements**

Responsible Role: Solution Architect

Accountable Role: Application and Data Architecture Service Director

Consulted Role: Compliance, Advising, and Security Engineering (CASE) Security Specialist, Information Security Officer

### **ARC-7.2 Create Trust Model**

Responsible Role: Solution Architect

Accountable Role: Application and Data Architecture Service Director

### **ARC-8.1 Create Deployment Diagram**

Responsible Role: Solution Architect

Accountable Role: Application and Data Architecture Service Director

### **ARC-8.2 Create Integration Architecture Diagram**

Responsible Role: Solution Architect

Accountable Role: Application and Data Architecture Service Director

### **ARC-8.3 Create Service Model**

Responsible Role: Solution Architect

Accountable Role: Application and Data Architecture Service Director

### **ARC-9 Document Product Architecture**

Responsible Role: Solution Architect

Accountable Role: Application and Data Architecture Service Director

### **ARC-10 Model Test Architecture**

Responsible Role: Solution Architect

Accountable Role: Application and Data Architecture Service Director

# **Product Architecture Process**

## **Process Activity Name: ARC-1 Model Domain Concepts**

The process map for ARC-1 Model Domain Concepts Map cycles through the following independent activities:

ARC- 1.1 Create Conceptual Business Diagrams

ARC-1.2 Create Domain Glossary of Terms

## **Process Activity Name: ARC-1.1 Create Conceptual Business Diagram**

### **Description**

The Solution Architect creates the Conceptual Business Diagram to define a business-centric view of entities and their relationships.

### **Artifacts Used**

Business Use Cases

Requirements Specification Document

### **Artifacts Created**

Conceptual Business Diagram

### **Responsible Role**

Solution Architect

### **Tools and Websites**

None Listed

### **Standards**

None Listed

### **More Info**

None Listed

## **Process Activity Name: ARC-1.2 Create Domain Glossary of Terms**

### **Description**

The Solution Architect creates the Domain Glossary of Terms to document all definitions needed to understand terms and acronyms used.



**Artifacts Used**

Business Use Cases  
Requirements Specification Document

**Artifacts Created**

Domain Glossary of Terms

**Responsible Role**

Solution Architect

**Tools and Websites**

None Listed

**Standards**

None Listed

**More Info**

None Listed

**Process Activity Name: ARC-2 Model Logical Architecture****Description**

The Data Analyst documents the logical and process views representing domain concepts. The Logical Architecture consists of diagrams that fully identify entity types, assigns data attributes defining those entities and their relationships. Logical modeling drives the direction of the physical database design: entity relationship diagrams and process models are used to ascertain the business requirements have been fully defined or if more analysis is required.

**Artifacts Used**

Business Use Cases  
Conceptual Business Diagrams  
Requirements Specification Document

**Artifacts Created**

Business Process Diagram

**Responsible Role**

Data Analyst

**Tools and Websites**

None Listed

**Standards**

None Listed

**More Info**

None Listed

**Process Activity Name: ARC-3 Model Functional Architecture**

The process map for ARC-3 Model Functional Architecture Map cycles through the following independent activities:

ARC-3.1 Create Activity Hierarchy Diagram

ARC-3.2 Create Functional Flow Diagram

ARC-3.3 Create Data Flow Diagram

**Process Activity Name: ARC-3.1 Create Activity Hierarchy Diagram****Description**

The Solution Architect creates the Activity Hierarchy Diagram to describe the hierarchical decomposition of events within the functional architecture components and identify the events that form the basis of the existing major system.

**Artifacts Used**

Business Use Cases

Logical Data Model Deliverables

Requirements Specification Document

**Artifacts Created**

Activity Hierarchy Diagram

**Responsible Role**

Solution Architect

**Tools and Websites**

None Listed

**Standards**

None Listed

**More Info**

None Listed

**Process Activity Name: ARC-3.2 Create Functional Flow Diagram****Description**

The Solution Architect creates the Functional Flow Diagram to document a logical flow of the functional decomposition and events of components.

**Artifacts Used**

Business Use Cases  
Logical Data Model Deliverables  
Requirements Specification Document

**Artifacts Created**

Functional Flow Diagram

**Responsible Role**

Solution Architect

**Tools and Websites**

None Listed

**Standards**

None Listed

**More Info**

None Listed

**Process Activity Name: ARC-3.3 Create Data Flow Diagram****Description**

The Solution Architect creates the Data Flow Diagram to define the behavioral and structural flow of data within the functional architecture components.

**Artifacts Used**

Business Use Cases  
Logical Data Model Deliverables  
Requirements Specification Document

**Artifacts Created**

Data Flow Diagram

**Responsible Role**

Solution Architect

**Tools and Websites**

None Listed

**Standards**

None Listed

**More Info**

None Listed

**Process Activity Name: ARC-4 Model Data Architecture****Description**

The Data Analyst creates the Data Definition Document to capture new data definitions and to describe the limitations and restrictions placed on the databases.

**Artifacts Used**

Business Use Cases  
Functional Model Deliverables  
Logical Data Model Deliverables  
Requirements Specification Document

**Artifacts Created**

Data Definition Document

**Responsible Role**

Data Analyst

## **Tools and Websites**

None Listed

## **Standards**

None Listed

## **More Info**

None Listed

## **Process Activity Name: ARC-5 Model Physical Architecture**

The process map for ARC-5 Model Physical Architecture Map cycles through the following independent activities:

ARC-5.1 Create Hardware Architecture Diagram

ARC-5.2 Create Topological Architecture Diagram

ARC-5.3 Create Nodes Connectivity Diagram

ARC-5.4 Create Configuration Diagram

## **Process Activity Name: ARC-5.1 Create Hardware Architecture Diagram**

### **Description**

The Solution Architect creates the Hardware Architecture Diagram to specify the dynamic and hierarchical decomposition of the physical resources (hardware components) that comprise the system.

### **Artifacts Used**

Business Use Cases

Functional Model Deliverables

Logical Data Model Deliverables

Requirements Specification Document

### **Artifacts Created**

Hardware Architecture Diagram

### **Responsible Role**

Solution Architect

**Tools and Websites**

None Listed

**Standards**

None Listed

**More Info**

None Listed

**Process Activity Name: ARC-5.2 Create Topological Architecture Diagram****Description**

The Solution Architect creates the Topological Architecture Diagram which visually describes how the functional architecture is distributed geographically and helps to understand the details of the relationship between components.

**Artifacts Used**

Business Use Cases  
Functional Model Deliverables  
Logical Data Model Deliverables  
Requirements Specification Document

**Artifacts Created**

Topological Architecture Diagram

**Responsible Role**

Solution Architect

**Tools and Websites**

None Listed

**Standards**

None Listed

**More Info**

None Listed

## **Process Activity Name: ARC-5.3 Create Nodes Connectivity Diagram**

### **Description**

The Solution Architect creates the Nodes Connectivity Diagram to illustrate the communication exchange required between components of the software as tasks and the operations that are executed.

### **Artifacts Used**

Business Use Cases  
Functional Model Deliverables  
Logical Data Model Deliverables  
Requirements Specification Document

### **Artifacts Created**

Nodes Connectivity Diagram

### **Responsible Role**

Solution Architect

### **Tools and Websites**

None Listed

### **Standards**

None Listed

### **More Info**

None Listed

## **Process Activity Name: ARC-5.4 Create Configuration Diagram**

### **Description**

The Solution Architect creates the Configuration Diagram. The Configuration Diagram provides the configuration views of the hierarchical decomposition of the functional architecture components, relates the functional architecture to the logical components, and identifies the functions that form the basis of the existing major system.

### **Artifacts Used**

Business Use Cases  
Functional Model Deliverables  
Logical Data Model Deliverables  
Requirements Specification Document

**Artifacts Created**

Configuration Diagram

**Responsible Role**

Solution Architect

**Tools and Websites**

None Listed

**Standards**

None Listed

**More Info**

None Listed

**Process Activity Name: ARC-6 Model Interface Architecture**

The process map for ARC-6 Model Interface Architecture Map cycles through the following independent activities:

ARC-6.1 Document Interface Requirements

ARC-6.2 Create Interface Architecture Diagram

ARC-6.3 Define Interface Data Mapping

**Process Activity Name: ARC-6.1 Document Interface Requirements****Description**

The Solution Architect documents the interface control information and incorporates this into the System Design Document (SDD) to specify the critical parameters of all inputs into and outputs from the software item. This includes target systems, external interfaces, and source systems.

**Artifacts Used**

Business Use Cases

Requirements Specification Document

System Design Document

**Artifacts Created**

Updated System Design Document



**Responsible Role**

Solution Architect

**Tools and Websites**

None Listed

**Standards**

None Listed

**More Info**

The Interface Control Document (ICD) is contained within the SDD.

**Process Activity Name: ARC-6.2 Create Interface Architecture Diagram****Description**

The Solution Architect creates the Interface Architecture Diagram which illustrates the primary flow of content between the databases and the users and the communication procedures that are used and that take place between them. This diagram activity drives the user interface design activity.

**Artifacts Used**

Business Use Cases  
Requirements Specification Document  
System Design Document

**Artifacts Created**

Interface Architecture Diagram

**Responsible Role**

Solution Architect

**Tools and Websites**

None Listed

**Standards**

None Listed

**More Info**

None Listed

**Process Activity Name: ARC-6.3 Define Interface Data Mapping****Description**

The Solution Architect defines the Interface Data Mapping and incorporates this in the System Design Document (SDD) to describe interfaces with other applications including those of other operational capabilities.

**Artifacts Used**

Business Use Cases  
Requirements Specification Document  
System Design Document

**Artifacts Created**

Updated System Design Document

**Responsible Role**

Solution Architect

**Tools and Websites**

None Listed

**Standards**

None Listed

**More Info**

The User Interface to Data Mapping is contained within the SDD.

**Process Activity Name: ARC-7 Model Security Architecture**

The process map for ARC-7 Model Security Architecture Map cycles through the following independent activities:

ARC-7.1 Document Security Requirements

ARC-7.2 Create Trust Model

## **Process Activity Name: ARC-7.1 Document Security Requirements**

### **Description**

The Solution Architect consults the assigned Information Security Officer (ISO) and Compliance, Advising and Security Engineering (CASE) Security Specialist in the development of the security requirements. The security requirements include, but are not limited to, Authentication and Authorization, Confidentiality and Integrity, Non-Repudiation, Data Exchange Requirements, Sensitivity of Data, Delivery Assurances, Confirmations, Logging and Traceability.

### **Artifacts Used**

Business Use Cases  
Functional Model Deliverables  
Logical Data Model Deliverables  
Physical Model  
Requirements Specification Document  
System Design Document

### **Artifacts Created**

Updated Requirements Specification Document

### **Responsible Role**

Solution Architect

### **Tools and Websites**

VA EA Home  
Office of Cyber Security (OCS) Portal

### **Standards**

VA EA Enterprise Technical Architecture (ETA) Compliance Criteria  
VA Directive 6500, Managing Information Security Risk: VA Information Security Program  
VA Handbook 6500, Risk Management Framework for VA Information Systems - Tier 3: VA Information Security Program

### **More Info**

Contact the Lead CASE Security Specialist using the [VHA10P2OIAHCSRREQUESTS@va.gov](mailto:VHA10P2OIAHCSRREQUESTS@va.gov) mail group. Contact the Director of Field Security Service using the VA FSO ISO Appointments mail group. The Enterprise Technical Architecture Compliance Criteria document establishes minimum Information Security compliance criteria for a product, product release, or service.

## **Process Activity Name: ARC-7.2 Create Trust Model**

### **Description**

The Solution Architect creates the Trust Model and assigns the trust ratings. Some components may trust others for all kinds of access, i.e. reading and writing data elements, yet other components may not allow any remote access to their data.

### **Artifacts Used**

Business Use Cases  
Functional Model Deliverables  
Logical Data Model Deliverables  
Physical Model Deliverables  
Requirements Specification Document  
System Design Document

### **Artifacts Created**

Trust Model

### **Responsible Role**

Solution Architect

### **Tools and Websites**

None Listed

### **Standards**

None Listed

### **More Info**

None Listed

## **Process Activity Name: ARC-8 Model Operational Architecture**

The process map for ARC-8 Model Operational Architecture Map cycles through the following independent activities:

ARC-8.1 Create Deployment Diagram

ARC-8.2 Create Integration Architecture Diagram

ARC-8.3 Create Service Model

## **Process Activity Name: ARC-8.1 Create Deployment Diagram**

### **Description**

The Solution Architect creates the Deployment Diagram. The Deployment Diagram documents the major hardware/software components supporting operations and their relationship to other components, including the functional architecture allocated to the physical architecture, derived input/output, technology and system-wide, trade off, and qualification requirements for each component.

### **Artifacts Used**

Business Use Cases  
Data Flow Diagram  
Functional Flow Diagram  
Interface Architecture Diagram  
Requirements Specification Document  
Security Architecture Deliverables

### **Artifacts Created**

Deployment Diagram

### **Responsible Role**

Solution Architect

### **Tools and Websites**

None Listed

### **Standards**

None Listed

### **More Info**

None Listed

## **Process Activity Name: ARC-8.2 Create Integration Architecture Diagram**

### **Description**

The Solution Architect creates the Integration Architecture Diagram that provides a pictorial view of the product's integration architecture with other entities. The integration points considered could be, but not limited to, integration with other products, external systems, databases, servers, intermediary interfaces, etc. It also documents the communication between the entities documented.

**Artifacts Used**

Business Use Cases  
Data Flow Diagram  
Functional Flow Diagram  
Interface Architecture Diagram  
Requirements Specification Document  
Security Architecture Deliverables

**Artifacts Created**

Integration Architecture Diagram

**Responsible Role**

Solution Architect

**Tools and Websites**

None Listed

**Standards**

None Listed

**More Info**

None Listed

**Process Activity Name: ARC-8.3 Create Service Model****Description**

The Solution Architect creates the Service Model which documents classes, details, and interfaces to build client and service applications.

**Artifacts Used**

Business Use Cases  
Data Flow Diagram  
Functional Flow Diagram  
Interface Architecture Diagram  
Requirements Specification Document  
Security Architecture Deliverables

**Artifacts Created**

Service Model

**Responsible Role**

Solution Architect

**Tools and Websites**

None Listed

**Standards**

None Listed

**More Info**

None Listed

**Process Activity Name: ARC-9 Document Product Architecture****Description**

The Solution Architect documents the product architecture models in the System Design Document (SDD). The Solution Architect provides a textual narrative and explanation of each of the created models and diagrams, including Domain, Logical, Data and Physical models.

**Artifacts Used**

Domain Model Deliverables  
Interface Architecture Model Deliverables  
Logical Data Model Deliverables  
Operations Architecture Deliverables  
Physical Model Deliverables  
Security Architecture Deliverables  
System Design Document

**Artifacts Created**

Updated System Design Document

**Responsible Role**

Solution Architect

**Tools and Websites**

None Listed

**Standards**

None Listed

**More Info**

The Product Architecture Document is contained within the SDD.

**Process Activity Name: ARC-10 Model Test Architecture****Description**

The Solution Architect updates the System Design Document to model and incorporate the Test Architecture Diagram in order to illustrate the logical flow of product component testing activities and determine the candidate architecture's testability.

**Artifacts Used**

Data Architecture Model Deliverables  
Functional Model Deliverables  
Integration Architecture Model Deliverables  
Logical Data Model Deliverables  
System Design Document

**Artifacts Created**

Updated System Design Document

**Responsible Role**

Solution Architect

**Tools and Websites**

None Listed

**Standards**

None Listed

**More Info**

None Listed

END OF PROCESS